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The Role of Social Science Research in Disaster Preparedness and Response

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Thank you very much for permitting me to present testimony today. My responsibilities at the University of New Orleans encompass directing an applied social science research center focused on assisting coastal Louisiana communities in developing resiliency to natural disasters.

I have spent the last 20 years involved in conducting research on natural disasters and the relationship between society and the environment. The Center for Hazards Assessment, Response and Technology (CHART), the center I currently direct, was damaged by hurricane Katrina. Due to the degree of virulent mold covering the offices and contents it has been sealed from access since the storm. The faculty associates and graduate students are scattered around the U.S. and of those students who have been able to return to the area, almost all have been hired by FEMA because of the applied disaster research experiences that they have acquired at CHART. I have been asked to respond to two very relevant questions. I am going to address the second one and in so doing also answer the first.

Here are the questions:

What makes people and places vulnerable to natural hazards and disasters? How does the natural and built environment impact the perception of risk and subsequent behavior?

How is social science research on disaster preparedness and response being translated into practice? What are the barriers to implementation of research findings and how can these barriers be overcome?

Applied Social Science Research on Disasters

CHART, the UNO center that I represent, was developed specifically to apply social science research to natural hazard threats. It was created to do so when such a model was not present. CHART is the application of sociological research in partnership with communities, organizations and government agencies (see Appendix A for a full list of the current CHART projects). As a means of answering the questions I will describe three CHART projects, one in each of the three Congressional districts that comprise southeast Louisiana. Each of these projects, as with all of the CHART projects, have both a basic and applied component. These

three examples show how social scientists can partner with communities to understand risk, increase safety and facilitate recovery from the catastrophic events of this fall.

Example #1: Repetitive Flood Loss

The first is in Congressman Jindal's district. FEMA has a program called Repetitive Flood Loss. We have been asked to maintain the files of the repetitively flooded residential structures within the most flooded parishes within Louisiana and to transfer the updated data to FEMA headquarters. We have been asked to do this so that CHART can work with local parishes and residents to assist them in using the data to reduce flood risk to their homes and to their areas. The logic for the project is that social science research argues for having agency assistance that is locally situated, able to be involved over a significant period of time and able to develop ongoing working relationships with community officials.

In addition, the project has expanded to demonstrate that the repeatedly flooded structures are found in clusters due to sub basin (watershed) drainage problems. If the solutions to the repeated flooding of individual structures can be addressed in local areas rather than for each individual home, then the integrity of the communities is maintained and there is cost efficiency in the process. Urban sociology recognizes that neighborhoods are vulnerable to decline if vacant lots are created and not maintained and the communities themselves become vulnerable without the tax base previously supported by those structures.

Considering approaching repetitive loss in a watershed manner rather than by mitigating each individual structure is new to FEMA. It is a neighborhood, community response rather than an individual one. By the reaction we received to the project when we were invited to demo it at FEMA headquarters, it is possible that the project may have national applications. This project takes a community sociology approach supported by GIS, floodplain planners, civil engineering and public administration specialists. Needless to say, the data in this project and the public portal developed for it are being used as we meet to support the long- term recovery of the New Orleans area from hurricane Katrina.

Example #2: Participatory Action Research

While the repetitive flood loss project provided FEMA with a different lens to view the problem of repeatedly-occurring flooding, the second project illustrates how scientific knowledge can be linked to the knowledge of the community. The second project is in Congressman Melancon's district. The National Science Foundation provided support for CHART to test a method of enhancing the capacity of marginalized communities to handle natural hazards entitled Participatory Action Research (PAR). This is the process of collaboration among academics, practitioners and community residents to support improving capacity and resiliency of communities that are at risk.

The community with which the project researchers are collaborating is a Native American community, Grand Bayou, that lives within the marsh outside of the leveed area and has done so for at least a century. During hurricanes they lash their boats together in the lee of low lying ridges to protect them, themselves and their valuables. Because coastal subsidence has so reduced the elevation of the land, a group of the residents selected a canal next to a land fill to shelter for Katrina as the hill created by the solid waste was the highest protection they could find. As the storm turned they pressed the boats into the bank by keeping the engines pushing forward. Today they are still living on the boats while seeking FEMA assistance.

The sociological findings beneficial to this project are the recognition that pre-disaster discrimination—be it economic, educational or social—will exacerbate the impact of a disaster on a community. Sociological research also indicates that enhancing the capacity of a community to take responsibility in partnership with government officials for its own hazard and disaster planning reduces vulnerability and contributes to a resiliency when future disasters occur.

Just last Saturday I joined the community when they met with FEMA representatives to talk about how they might be able to place their FEMA trailers at their community center rather than to have to relocate a distance from their homes and boats. The way in which the community was negotiating their fate and expressing their needs in a forceful, informed manner is a demonstration of their capacity that hopefully has been assisted in a small way by the Participant Action Research process. The challenge is the time that is required by a community to overcome the marginality while they must, of course, continue to occupy themselves with work—most combining several means of earning a living, child care, family and community obligations. The challenge to the applied social scientists is to know what the research indicates and to find ways to implement it to the betterment of a community. Even though the Grand Bayou community is small, the partnership with a group of social and physical scientists strengthened their own capacity and also provided new insights for application to other rural, coastal communities.

Example #3: Hurricane Evacuation Behavior

The project in Grand Bayou showed the universal in the particular; the third project shows how traditional social science survey data can be transformed into building partnership with parish and state government and empowering public officials. The third project encompasses all three of the Congressmen's districts, those of Melancon, Jindal and Jefferson. It was a citizen hurricane evacuation behavior survey with a large enough sample to be confident of its applicability to each of the 12 Southeast Louisiana parishes. The survey was accomplished by partnering with the parish (county) emergency managers to create the survey instrument so that the information needs of their jurisdictions would be supported. They were included them in every step of the data collection and were the sponsors and conveners of the workshop where the data was collectively presented and discussed.

Six weeks before Katrina struck the data was also shared with the La. Dept of Homeland Security and the La. Department of Transportation and Development, the latter group taking the lead on developing the hurricane traffic contra flow plan. As each of these governmental units warned of the impending peak of the hurricane season and engaged in their part of the planning for an evacuation using contra flow, they were able to appreciate better how their residents saw the risk, what plans the residents were or were not making and what aspects of the residents' thinking ran contrary to what the scientists knew about safety and evacuation experiences. DOTD used the results in their "marketing" of the contra flow plan and map. However, our findings were so worrisome—2/3rds of the population felt safe in their homes in a category 3 storm—that they were uncertain how strong to make the media advisory. Fortunately, Katrina approached as a category 5 and thus overcame the resistance to evacuation. It is estimated that 80% of the population evacuated (See Appendix B for a report of this survey).

The use of existing social science disaster research for this project is very evident. Dr. Susan Howell, Director of the UNO Survey Research Center, first drew upon the evacuation literature to ask questions about evacuation after hurricane Georges. Her findings from that earlier study had some of the longest "shelf life" of any of the many surveys that she has completed. To complete the recent evacuation surveys she drew upon that same literature, prepared a draft instrument and then asked for modifications from the Emergency Managers. With each parish's participation

there were improvements to the instrument and questions about unique evacuation information needs of each parish. Partnering with the basic researchers (through their findings and phrasing of questions) along with the practitioners “on the ground” resulted in a product and process with the most benefit. The emergency managers “took ownership” of the findings and trusted that they represented their residents’ evacuation attitudes.

Research Needs

Applied research starts with basic scientific research and employs it in specific settings and/or to address practical problems. In the course of doing applied research, however, we expand on and make contributions not only to problem solving, but also to basic science. Thus, while the funding of basic scientific research is critical, it is not enough if we are to address the needs to understand and mitigate risks and disasters. We must take science into the field, test it, and modify it. This requires funding sources for applied research, especially as it relates to hazards and disasters. When I tried to expand the NSF Participatory Action Research Project (described above) reviewers questioned the appropriateness of NSF funding such applied research. Federal “mission” agencies such as EPA, NOAA, and FEMA are beginning to recognize the importance of such research but to date this has been minor and intermittent. FEMA pleaded “poverty” when asked by Senator Landrieu after hurricane Ivan to supplement the initial evacuation study with a follow up to examine evacuation fatigue after the near hit. Much more of a commitment from these agencies is necessary.

The reason for this lack of commitment is the past inability of the society to successfully prevent the catastrophic impacts of natural and technological disasters. We cannot stop a hurricane, but we can plan for evacuations, greater protection, greater resiliency and in general safer ways to live and work. **So, I believe that it is extremely important to fund the broader, more basic research questions of how to enable our society to embrace a more successful approach to natural disaster response.** A significant body of work has emerged but much more needs to be done. Examples of such extremely “useful” research include Charles Perrow 1980s work (*Normal Accidents: Living with High-Risk Technologies*) that considered the complexity of the cause of technological failure, Lee Clarke’s work (*Mission Improbable: Using Fantasy Documents to Tame Disaster*) about the weaknesses in disaster response plans and his just released research, *Worst Cases* in which he challenges the use of probability instead of possibility in considering risk. Roger Pielke’s work explores the importance of integrating social science research with the physical in his analysis of climate policy and the weather community not embracing the decision needs of users, i.e. the human dimensions of the challenge (*Prediction: Science Decision Making and the Future of Nature* with William Hooke).

The usefulness of this research is exemplified by Diane Vaughn’s research *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*. When the shuttle Columbia crashed in 2003 the investigating commission adopted many of her recommendations in their proposal for the reorganization of NASA activities. Ongoing research like that of Bob Gramling and Bill Freudenburg on the “five disasters” of Katrina, all but one being social disasters rather than physical, is the type of work that is

emerging from this current catastrophe which has potential to assist in adjusting the societal response to these events.

Much more of such quality research and implementation of the findings must be achieved. We no longer can delude ourselves that we have the resources as a society to accept another Katrina, a nuclear accident, or any other event of such magnitude when the means to mitigate these are emerging from social science research on risks and disasters. We must fund such research and keep it front and center as we address these critical issues.

Resistance to “hearing” the findings of such basic research as well as that of the applied work which we do is remarkable. I want to end my testimony with an example demonstrating the extreme resistance that must be overcome.

The Tale of the Hurricane Katrina “Whistle Blowers”

I was requested to give testimony to this committee for a few reasons— having disaster social science expertise, trying to apply the findings of social science research, being the director of a research center that was the victim of hurricane Katrina, to name a few. More specifically, I was one of the scientists who predicted with unwavering accuracy that such an event as Katrina would happen and what the results would be when it did.

<http://www.colorado.edu/hazards/o/nov04/nov04c.html>

My predictions were a compilation of the research findings of many scientists, physical as well as social. And they too were speaking about what their findings told them. I was not a lone voice, but rather was among a chorus of scientists from both physical and social science disciplines who predicted that it would happen and what the consequences would be. The specialties of the other scientists included coastal geologists, coastal hydrologists who do hurricane impact modeling, geographers, demographers, stratification and community sociologists, coastal ecologists, civil engineers, political science policy specialists and meteorologists. And the cases they made were not only in scientific journals but also in the popular media and applied professional publications such as *Scientific American*, *National Geographic*, *Natural History*, the *Natural Hazards Observer*, the *New York Times*, *Washington Post* and *Los Angeles Times* and the prize-winning series in the *New Orleans Times Picayune*.

We also presented our conclusions at numerous professional gatherings. And when we did one could feel the audience inhale. A few would come up after the talk to tell us of their shock. Others would say we were exaggerating and dismiss us as “doomsayers”. On occasion someone would follow up with an email, phone call and take steps to broadcast in their own professional or even personal world what we predicted was going to happen.

The last example of this before Katrina was a lengthy phone conference call a CHART colleague and I had with a NOAA official four days before Katrina hit. He had been horrified by the content of the abstract of my June Hart Senate Bldg. presentation available on the American Meteorological Society web site predicting Katrina in which I described the incredible challenges that the poor would experience evacuating the city.

<http://www.ametsoc.org/atmospolicy/documents/SeminarFlyer.pdf>

Before the storm hit he prepared a nationwide letter to the Catholic bishops. That was an important personal act but given the enormous data available, why didn't the existing research

matter enough to prevent, or at least, reduce the devastation that has occurred? To put it differently, how could it be that the society at all levels was not organized or prepared “to hear.”

The federal government has been the sponsor of most of the research that has been conducted by social scientists on environmental disasters. Because of its role it is the prime level of government to be leading an effort to expand the research and to facilitate its use; I encourage it to take stronger responsibility for using the findings to the betterment of society.

It is imperative that social science research be seen as an equal contributor to the physical sciences in asking the most pertinent research questions about environmental disasters, in formulating powerful research questions and in receiving support to implement top quality research. But as that is accomplished we must find better ways for the organizations, the government agencies, the policy makers to value the findings and to address the obligations of their positions more responsibly (a finding of Bill Freudenburg’s research on risk and “recreancy”, *Social Forces*, 1993) and that includes with recognition of the importance of using social science research findings.

Final thought. I was not participating in some abstract intellectual exercise during the last few years as I was drawing from my own and others’ existing research to warn professional group after professional group of an impending Katrina. The result of those warnings not being heeded was the end of my community. And as our warnings were accurate, this doom assessment of the impact is not hyperbole. Recovery of coastal Louisiana from hurricanes Katrina and Rita is in my opinion uncertain. We do not yet know if we have the family, organizational and governmental resources, ability and energy to accomplish it. And the cost to the society is astronomical. This is the outcome of scientists not being heard. And it doesn’t get any more personal for a scientist than Katrina has been for me.